

Leak Down Tester 101



Motorcycle engines, when properly taken care of, last a long time. It can be years, and thousands of miles of riding. If you have owned a bike for a long time, or maybe just found a great deal on an older bike that has some miles on it, how do you know for sure what condition it is in? Sure, looking at tires or chain and sprockets will tell you how it is in general, but how do you know what is going on inside the engine? A compression test will tell you if the cylinder is sealing, and if all cylinders are in similar condition, but that's about it. A compression test won't tell you about the condition of the rings, or whether the valves are sealing, it will just say that things look good or bad.

So how do you know for sure? This is where a leak down tester comes into the picture. A leak down tester will give you very specific numbers on the condition of the cylinder, not only an absolute number, but will also indicate where a potential problem may lie, whether it's rings, valves, or even cylinder gasket sealing. This is all very useful information to have when diagnosing the condition of an engine. There are two types of leak down testers, one for four stroke engines, and one for two strokes.

In the four stroke version, the cylinder is brought to top dead center on the compression stroke, so that all of the valves are completely closed. Then, the cylinder is pressurized with compressed air through the tester. If the cylinder is leaking, there will be a differential in pressure between the cylinder and the tester, and the tester will indicate the leakage in a percentage. 5% or less leakage indicates an engine in excellent condition. Up to 15% leakage means an engine in acceptable condition. Anything above 15% would be an indication that engine repair is needed. A great side benefit of using a tester of this type is that it is easy to pinpoint the leakage while the cylinder is pressurized. If the intake valves are leaking, you will hear the pressure escaping at the carburetor or throttle body. If the exhaust valves are a problem, the leak will be heard in the exhaust pipe. Ring leakage can be heard in the crankcase breather hose. Even the head gasket can be diagnosed, if there is a leak there, you will see bubbles coming out of the coolant in the radiator. This is a truly handy tool, and with just a short amount of time, a mechanic can form a very detailed picture of the condition of the engine he is working on.

The two stroke version works in a very different fashion. While a leaking 4 stroke engine will suffer a performance loss, two strokes that leak will also suffer other problems, like uncontrolled engine acceleration, due to the additional air leaking in and leaning out the mixture. In testing a two stroke engine, the primary concern is the condition of the seals at the crank, crankcase and power valve, so testing is quite different. With this kit, the intake and exhaust ports are blocked with plugs, and only a small amount of pressure is introduced into the engine via a hand pump. This pressure is then observed over a short period of time, and any drop in pressure noted. Leaks in the engine can be found by listening at the crank ends behind the covers, or through the engine and

transmission oil filler plugs. Again, any head gasket leakage can be found by looking for bubbles in the coolant. Case leaks can be found by using soapy water on the joints of the case.

Testing of this kind is very important to be sure that your engine is in top shape. It will also indicate components that are wearing before an engine failure really ruins your day. Of course, Motion Pro makes testers of both kinds, and many other tools that make engine work a much less tedious job.